

## Language mixing in young bilinguals\*

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### ABSTRACT

The speech of four two-year-old children growing up bilingually in a German-speaking community was studied for periods varying between five and nine months. An analysis of their language mixing revealed an initially higher rate of mixing which diminished with a growth in language development as measured in MLU. The data suggest that the children were at various stages in a gradual process of language differentiation thus providing support for the one-system theory of bilingual acquisition. An examination of the distribution of lexical substitutions by part of speech revealed that nouns were most frequently substituted by all children; however, more function words were substituted than content words overall.

### INTRODUCTION

Early diary studies by linguist parents reporting on the language development of their bilingual children describe an initial mixed stage in language production consisting of indiscriminate combinations of elements from each language (Leopold 1970, Imedadze 1967). Other more recent accounts of bilingual development also report frequent mixing in the early stages (Oksaar 1976*a, b*, Swain 1977, Volterra & Taeschner 1978). These authors have all suggested that children acquiring two languages simultaneously from infancy begin by processing the languages as a single system, and only gradually differentiate the two. Some investigators studying developmental bilingualism, however, have reported a minimal amount of mixing by their young subjects and have suggested that a bilingual child may essentially be able to keep the two languages separate from the earliest stages of linguistic development (Padilla & Liebman 1975, Bergman 1976, Lindholm & Padilla 1978).

Since degree of language mixing is generally regarded as evidence in support of either the one-system or the two-system approach to bilingual acquisition, it is extremely important to study mixing in relationship to overall linguistic growth patterns. Yet no previous investigators have made a systematic analysis of mixing with respect to language development in terms of age or MLU.

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Another shortcoming of some studies is that arguments have been based on examples without being accompanied by distributional data, e.g. Oksaar (1976*a, b*) and Volterra & Taeschner (1978). Furthermore, in those studies where distributional data have been given, frequencies have been reported in tokens instead of in types (Swain 1974, Swain & Wesche 1975, Padilla & Liebman 1975, Lindholm & Padilla 1978). Frequency in token utterances is somewhat misleading, especially in the early stages of language development when young children often use the same utterances repeatedly in various situations. The present study has attempted to overcome these methodological difficulties by investigating the mixing phenomenon from a developmental perspective. The spontaneous speech of four children growing up in a German community has been examined for language mixing. The amount of mixing by each child has then been analysed in relationship to linguistic development as measured by MLU. In addition, an analysis has been made of the distribution of substituted lexical items by part of speech.

#### METHOD

##### *Subjects*

The subjects were all children of German fathers and non-German mothers residing in the Freiburg, Germany area. Two of the children, the Spanish/German and the English/German bilingual, were in Stage I (Brown 1973) at the beginning of the study. The other two children, both French/German bilinguals, were in Stage III when first observed. The children were observed over periods varying from five to almost nine months. All subjects were first-born children with no siblings. Language background information on each child is given in Table 1. Information on language usage in the home was provided by the mother who reported which language she and her husband spoke together and estimated what percentage of each language was spoken to the child by herself and by the father. In the cases of Danny and Marc, the one person/one language formula seems to have been closely followed. Danny learned only English from his parents and acquired German through regular visits with his monolingual grandmother and neighbourhood playmates. Although Henrik was customarily addressed in either language by his parents and Marcus in either language by his mother, the children were reportedly not exposed to language mixing within sentence boundaries.

##### *Procedures*

Thirty to forty-five minutes of taped spontaneous speech samples was collected in the children's homes approximately every three weeks by the first author, a native speaker of English who is also fluent in German and Spanish. She spoke only in German with the French/German subjects and primarily in German with

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TABLE 1. *Language background information*

Child	Mother's language (L <sub>1</sub> )	Father's language (L <sub>2</sub> )	Period observed in months	Age at onset of study	Parents speak together <sup>a</sup>	Mother to child in L <sub>1</sub> <sup>a</sup>	Mother to child in L <sub>2</sub> <sup>a</sup>	Father to child in L <sub>2</sub> <sup>a</sup>	Father to child in L <sub>1</sub> <sup>a</sup>
Marcus	Span	Ger	5½	2; 0.1	L <sub>2</sub>	70	30	100	0
Danny	Eng	Ger	8½	1; 11.22	Both	100	0	0	100
Henrik	Fr	Ger	8	2; 4.8	L <sub>2</sub>	70	30	70	30
Marc	Fr	Ger	5	2; 8.19	L <sub>1</sub>	100	0	100	0

[<sup>a</sup>] Mother's estimate of language usage (in percentages).

the other subjects. In all cases, the child's interaction with the mother in the non-German tongue was regularly recorded, and in the case of Marcus, verbal interaction with the father in German was also taped from time to time. In addition to tape recording each home session, notes were taken on the child's speech and on the specific situational context at the scene. The tapes were transcribed by the first author generally within three days following a home visit.

The calculation of MLU was based on Brown's (1973:54) rules with some modifications. Park (in press) had already concluded that counting all inflections as separate morphemes results in an inflated MLU when dealing with inflected languages such as German. Therefore only correct inflectional forms were taken into account in the calculation of German, French, and Spanish MLUs. Another modification involved the exclusion of *no* and *yeah* and their equivalents in German, French, and Spanish from MLU calculation. The decision to make this modification was based on two factors: (1) a general saliency noted of the German affirmative *ja* in the speech of all children, even when they were conversing in the non-German language, and (2) the difficulty in determining to which language the affirmative /*ya*/ belonged in the case of the English/German child. Thus, the *no/yeah* exclusion reflects the attempt made to be as consistent as possible in MLU calculations of the four subjects. An overall MLU value was calculated on the basis of the first 100 utterances regardless of language. For purposes of analysis, the speech data was divided into periods, each containing the speech samples from two adjacent home visits. The MLUs were calculated separately for each session and then averaged together for each period. Since there was an odd number of sessions in the case of Henrik, the final session was taken alone.

In this study, language mixing refers to the combining of elements from two

languages in a single utterance. Mixing may involve the insertion of a single element or of a partial or entire phrase from one language into an utterance of the other language:

- (1) And the froggie's getting *nass*. ('... wet.')
- (2) Das ist ein Knochen *pour chien*. ('That is a bone for dog.')
- (3) *Le cheval* ist zu müde. ('The horse is too tired.')

The percentage of mixed utterances occurring in a given period was calculated only on type utterances rather than on token utterances:

$$\% \text{ mixed utterances} = \frac{\text{no. mixed utterances}}{\text{no. multiple utterances}} \times 100.$$

## RESULTS AND DISCUSSION

### *Language mixing in relation to linguistic development*

Table 2 shows the percentage of mixing for each child by period in relationship to age and MLU. Marcus, who moved out of Stage I (Brown 1973) of linguistic development only during the 5th and final period, produced mixed utterances averaging 25 % over the entire time observed. Danny, whose language development covered late Stage I to Stage V produced an average 10.8 % mixed utterances; Henrik and Marc, who went through Stages II–V, exhibited the lowest rate of mixing amounting to 7.3 % and 1.8 % respectively. In general, the children whose language was more advanced produced fewer mixed utterances than the children at earlier stages of development suggesting that the amount of mixing and language development are reversely associated.

Various linguistic and sociolinguistic factors seem to have influenced the degree of mixing when observed on the individual level. At the beginning of observation, Marcus appeared to have basically one lexical system consisting of words from both languages. A vocabulary list compiled for him at the end of the first period contained only four sets of corresponding words out of a list of 36 Spanish, 33 German and 11 Spanish/German items, i.e. words which could be considered belonging to either language. During the time observed, Marcus gradually added corresponding equivalents to his vocabulary list but seemed unable to draw a clear-cut distinction even by the end of observation. This is illustrated by the following examples from the 5th and final period:

(Father (F) and Marcus (MS) looking in book)

F Und was macht er hier ? ('And what's he doing here ?')

MS Haare putzen. ('Hair cleaning.')

F Ja, er wäscht die Haare, und dann auch ? ('Yes, he washes his hair, and then also ?')

MS Jabón! ('Soap!')

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TABLE 2. *Computed MLU and percentage mixing*

Period	Age	MLU	% Mixing
Marcus			
1	2; 0.1-2; 1.1	1.39	30.0
2	2; 1.2-2; 2.4	1.47	19.5
3	2; 2.5-2; 3.16	1.50	27.5
4	2; 3.17-2; 4.22	1.90	26.8
5	2; 4.23-2; 5.20	2.21	21.2
Danny			
1	1; 11.22-2; 0.12	1.92	20.8
2	2; 0.13-2; 1.23	2.46	12.0
3	2; 1.24-2; 3.24	3.00	7.4
4	2; 3.25-2; 5.8	2.92	5.5
5	2; 5.9-2; 6.18	3.35	14.6
6	2; 6.19-2; 8.7	4.07	3.7
Henrik			
1	2; 4.8-2; 5.0	2.89	11.9
2	2; 5.1-2; 6.9	2.98	8.2
3	2; 6.10-2; 9.17	3.04	9.9
4	2; 9.18-2; 11.28	3.74	6.5
5	2; 11.29-3; 1.14	3.94	5.0
6	3; 1.15-3; 2.11	4.87	2.5
Marc			
1	2; 8.19-2; 9.11	2.66	2.6
2	2; 9.12-2; 10.22	3.36	2.1
3	2; 10.23-3; 0.4	3.84	2.3
4	3; 0.5-3; 1.20	3.61	0

F Bitte ? ('What ?')

MS Jabón! ('Soap!')

F Mit der Seife. Und was macht er denn hier ? ('With the soap. And what is he doing then here ?')

MS Putzen Zähne con jabón. ('Brushing teeth with soap.')

(Mother (M) and Marcus (MS) looking in book)

M ¿Qué hacen los niños ? ('What are the children doing ?')

MS Müd. Die Kinder da müde. ('Tired. The children there tired.')

M ¿Están cansados ? ¿No juegan los niños ? ('Are they tired ? Aren't the children playing ?')

MS Das no juegan. Árboles! ('That not playing. Trees!')

M ¿Qué hay en los árboles? ('What are on the trees?')

MS Manzanas. Hund schlafen. ('Apples. Dog sleeping.')

In addition to the linguistic factors already mentioned, the lack of strict language separation by person in Marcus' linguistic environment, where the mother also spoke German to him an estimated 30 % of the time (Table 1), may have had an effect on his overall high rate of mixing.

Danny's initially high rate of mixing is due in part to the repeated use of the newly acquired German article *ein* ('a') with English nouns. Almost half of the mixed utterances from this period were of this type:

- (4) Ein chu-chu train.
- (5) Ein big cow.
- (6) Ein chu-chu smoking.

Such a combination rarely occurred after the first period since the English article *a* had now been acquired. An interesting example from the data suggested that Danny was consciously aware that he was dealing with two languages at least by the 4th period. He was accustomed to being addressed only in English by his mother (Table 1), who admittedly switched to German occasionally to test his reaction. When the mother switched to German during the 4th visit (Period 2), Danny (2;1.23) appeared not to notice.

(Danny (D) conversing with mother (M) and investigator (I))

- I Und wie geht's Anne? ('And how's Anne?')
- M Was hat Anne gemacht? ('What did Anne do?')
- D Anne go Bein boom. Boom. Anne Bein boom. Anne weint. ('Anne go leg boom. Boom. Anne leg boom. Anne cries.')
- I Anne weint immer noch? ('Anne's still crying?')
- M Nicht immer noch, Danny. ('Not still, Danny.')
- D Phillip auch. Phillip weint. ('Phillip too. Phillip cries.')

(M leaves room and D and I continue conversation in German)

However, when his mother switched to German during Period 4, Danny (2;4.14) reacted immediately:

- D (looking in book) Katze. Die hat da bissen die Vögel. ('Cat. She has bitten the birds.')
- I Die Katze möchte den Vogel auffressen. ('The cat wants to eat the bird up.')
- M Was macht der Vogel? ('What's the bird doing?')
- D (looking at M startled) Nicht Vogel! ('Not bird.') (pointing to I) Du Vogel. ('You bird.') (pointing to M) Du sag birdie. ('You say birdie.')

Danny's mixing rates progressively decline as his MLU increases but for a notable exception at Period 5 (Table 2). At this point, the child had just returned from a week's visit with his monolingual German grandmother and was including more German when speaking with his mother. The child's increasingly futile attempts to speak purely English with his mother undoubtedly account for the rise in mixing rate during the 5th period.

(Mother (M) and Danny (D) looking in picture book)

- M Do you think that cat's going to eat all those things ?  
 D Nein, ich glaub' nicht. Hat doch ummp gemacht. ('No, I believe not. Has made ummp.')  
 M Don't you speak English anymore ?  
 D Nein. German.  
 M Why ?  
 D Guck, der Esel. Mehr books. More books. (gets up to look for more picture books)

(Later with another book)

- M Where do you think that boat's going ?  
 D In - to America.  
 M Do you think so ?  
 D Guck, alle Auto on the ship. ('Look, all auto on the ship.') (pointing to aircraft carrier)  
 M Those aren't autos!  
 D Doch! (emphatic 'Yes!')  
 M No, look at them. With wings ?  
 D Cars. With the cars rauf. ('...on top.')

From Period 5 on Danny's German so dominated his speech that by Period 6 he had virtually stopped speaking English, producing less than 25 English utterances during each of the final two visits.

Henrik produced a lower amount of mixed utterances than either Marcus or Danny probably because he was already more advanced linguistically (Stage III) and basically in possession of corresponding lexical items in the two languages at the onset of observation. It is possible that Henrik's overall mixing rate was higher than that of Marc, who was also in Stage III at the onset of the study, because of a lack of strict separation by person in Henrik's linguistic environment, i.e. he was customarily addressed in either language by both parents (Table 1). It is interesting to note that during the final period, Henrik suddenly evidenced a reluctance to speak French in the presence of the investigator whom he considered to be a monolingual German speaker. The transcripts show several instances of him translating his mother's comments into German for the investigator and then proceeding to respond to the mother in German.

(Henrik (H), mother (M) and investigator (I) looking at book)

- M Regarde le crocodile qui morde. ('Look at the crocodile that's biting.')  
 H (turning to I) Der beisst! Schaumal, ist ein Karotten-auto ist das. ('He bites! Look, is a carrot car is that.')  
 I Kann man das essen ? ('Can one eat that ?')

- H Ja, das kann man es essen. ('Yes, that one can eat it.')
- M Et puis ça marche pas. Si tu mange le carotte, le toto ne marche plus. ('And then it won't go. If you eat the carrot, the toot-toot won't go.')
- H Und das, das eine Moto. ('And that, that a motorcycle.')
- M Et ça qu'est-ce que c'est ? ('And that, what's that?')
- H Toto fromage. ('Cheese toot-toot.') (turning to I) Ein Keksauto. ('A cheese car.')
- (Henrik (H), mother (M) and investigator (I) discussing father)
- M Oú est-ce qu'il est ton Papa ? ('Where is your Papa?')
- H (to I) Der ist in Büro gegangen. ('He has gone to office.')
- M Qu'est-ce qu'il fait là ? Qu'est-ce qu'il fait au bureau ? ('What does he do there ? What does he do in the office?')
- H Travaille. ('Works.')
- M Il travaille, oui. Comment il travaille, Papa ? ('He works, yes. How does he work, Papa?')
- H (turning to I) Der arbeitet, der Papa. ('He works, Papa.')

Marc's overall mixing rate was the lowest of all children observed and he seemed to be differentiating the languages to a considerable degree already at the onset of observation (Stage III). The fact that there was a strict language separation by person in his environment may have played a role in his learning to differentiate sooner and therefore to mix less than someone like Henrik who heard both languages from both parents.

Although the degree to which the one person/one language formula was realized in the linguistic environment of the four children differed, their parents reportedly did not engage in language mixing. When a bilingual child is not confronted with models of mixed speech from the parents, the degree to which the languages are mixed should be an indication of his ability to differentiate between languages. Overall, mixing rates of the four subjects decreased with advancing linguistic development. Furthermore, the mixing rates measured at earlier stages of development were lower than those at later stages. These findings suggest that the subjects were involved in a gradual process of language differentiation and are in agreement with those of previous investigators supporting the one system approach to bilingual acquisition. The findings conflict however with those of investigators supporting the two-system approach. This discrepancy may possibly be accounted for by differences in methodology. Bergman's (1976) report was primarily an anecdotal account lacking such systematic measurements as MLU calculations. Padilla & Liebman (1975), although calculating growth in MLU, did not present a distributional analysis of mixing. Furthermore, they calculated the percentage of mixed utterances on a token basis and did not clearly state whether the calculation was a percentage of the total number of utterances or a percentage of only multiple-word utterances.



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TABLE 3. *Percentage distribution of single mixed items by part of speech*

Contentives	Danny		Henrik		Marc	
	N	%	N	%	N	%
Noun	49	(30.6)	27	(37.0)	8	(53.3)
Verb	18	(11.3)	5	(6.9)	—	—
Adjective	8	(5.0)	—	—	2	(13.3)
Subtotal	75	(46.9)	32	(43.9)	10	(66.6)
Functors						
Adverb	30	(18.8)	26	(35.6)	2	(13.3)
Article	30	(18.8)	2	(2.7)	1	(6.7)
Pronoun	23	(14.3)	9	(12.3)	—	—
Preposition	1	(0.6)	1	(1.4)	2	(13.3)
Conjunction	1	(0.6)	3	(4.1)	—	—
Subtotal	85	(53.1)	41	(56.1)	5	(33.3)
Total	160		73		15	

Lindholm & Padilla (1978), on the other hand, by pooling the data from five subjects of greatly varying age (2 ; 10-6 ; 2), did not deal with the developmental aspect of mixing.

*Distribution of single lexical and phrasal substitutions*

The distribution of single lexical substitutions by part of speech in the mixed utterances of Danny, Henrik, and Marc is shown in Table 3; Marcus was not included because of his generally low level of lexical differentiation throughout the observation period. Nouns were the most frequently substituted elements by all three children. Some examples are:

*Danny*

- (7) From up in *Himmel*. ('From up in sky.')
- (8) She's in *Kirche*. ('She's in church.')
- (9) Ich will nicht *gum*. ('I don't want gum.')
- (10) Der *monkey* will beissen. ('The monkey wants to bite.')

*Henrik*

- (11) Va dans le *Wasser*. ('Goes into the water.')
- (12) Fait des - de *Blume*. ('Makes the - the flower.')
- (13) Und da ist weg der *mouche*. ('And there is gone the fly.')
- (14) Wo ist die *livre* ? ('Where is the book ?')

*Marc*

- (15) Tombé *Eisenbahn*. ('Train fell.')
- (16) L'auto la *Licht* aussi. ('The auto there light also.')

(17) Das ein chemin. ('That a road.')

(18) Clé ist da. ('Key is there.')

Among contentives, the next most frequently substituted category was that of verbs. Substituted verbs were most often correctly conjugated with respect to subject or object referent.

#### *Danny*

(19) *Guck*, that's red. ('Look...')

(20) Danny *mach* fix. ('Danny make...')

(21) An umbrella *hat*. ('...has.')

(22) *Getting* jetzt nass. ('Getting wet now.')

#### *Henrik*

(23) Il *liest* avec hibou. ('He reads with owl.')

(24) Qu'est qu'il y a *passiert*? ('What has happened?')

(25) *C'est* VW kaputt hier. ('It is VW broken here.')

(26) Ein Messer zum *couper*. ('A knife for cutting.')

It is interesting that only Danny mixed on the morphological level, and then only in the verb category. English verb and auxiliary affixes were applied to German elements:

(27) *Pfeifing* ('Whistling.')

(28) Nashorn vorne's eating. ('Rhinoceros in front's eating.')

(29) Die Mädchen's going night-night. ('The girl's...')

In addition, German verb affixes were applied to English elements:

(30) Da Polizei *geticktet*. ('There police ticketed.')

(31) Der pusht der kleine Josef. ('He pushes the little Joseph.')

Adjectives were the least substituted of the contentives.

#### *Danny*

(32) That's too *gross* ('...big.')

(33) And the froggie's getting *nass*. ('...wet.')

(34) Daddy's *red* Auto fallen. ('...car fell.')

(35) Da *fire* Auto. ('There fire car.')

#### *Marc*

(36) Pour l'auto *rot*. ('For the red car.')

(37) L'auto est pas cassée, l'auto *grün*. ('The car is not broken, the green car.')

Among functors, adverbs were the most frequently substituted part of speech. Mixing in this category often involved the insertion of the German locative

adverb *da* ('there') into L<sub>1</sub> utterances and accounted for 1/3 of the adverb substitutions of both Danny and Henrik. Marc's two adverb substitutions were of this type.

*Danny*

- (38) *Da* big truck. ('There...')
- (39) Danny *auch* bottle? ('Danny also...?')
- (40) Mehr gucken *now*. ('More looking now.')
- (41) Er geht *up*. ('He goes up.')

*Henrik*

- (42) Ça marche, un moto *da*. ('It goes, the motorcycle there.')
- (43) La luge, *ja*. ('The sled, yes.')
- (44) Das ganz gefährlich, *non*? ('That very dangerous, no?')
- (45) *Encore* das *da*. ('Again that there.')

*Marc*

- (46) Et *da* le lit. ('And there the bed.')
- (47) *Da* lumière. ('There light.')

Articles were substituted frequently by Danny but only rarely by the other two children.

*Henrik*

- (48) *Die* bateau monte. ('The ship rises.')
- (49) *Ein* toto rue. ('A toot-toot street.')

*Marc*

- (50) A joue *die* dame. ('To play the lady.')

Half of Danny's substituted articles occurred during the second visit (Period 1) as the *ein* previously mentioned. The German *ein* is an article like English *a* as well as a pronoun cognate with *one*. Danny's use of *ein* in mixed utterances during the second visit was viewed as an article usage for several reasons. During the same session it was used just as often with German nouns as with English nouns including once in the well-formed utterance *Das ist ein Koffer*. ('That is a suitcase.')

During the following session the English article *a* appeared and occurred eight times with English nouns while the use of *ein* with English nouns had dropped to three instances. Furthermore, during the third home visit, *ein* occurred clearly as a pronoun for the first time in *Ein in Auto* ('One in car.' – child putting one stick into his toy truck) as did its English counterpart *one* in *One for big truck* (child picking up one block to fit into toy truck). In later sessions, Danny was observed to use the English article *a* with German nouns –

the only case of substituted  $L_1$  articles among the children. Interestingly, these substitutions all involved noun cognates:

- (51) *A* Kuh. ('A cow.')
- (52) *A* Schiff. ('A ship.')
- (53) Guck, *a* Schneemann. ('Look, a snowman.')

In the pronoun category, only German pronouns were substituted. The majority of pronoun substitutions involved the use of the demonstrative pronoun *das* (sometimes/da/) in the semantic function of nomination. Fifteen of Danny's pronoun substitutions were of this type, 13 of which occurred during Period 1. Seven of Henrik's pronoun substitutions were of this type, over half of which occurred during Period 1.

*Danny*

- (54) *Da* too big. ('That...')
- (55) *Das* black engine. ('That...')

*Henrik*

- (56) *Das* encore marche avant. ('That again goes ahead.')
- (57) *Das* auto du Wendy. ('That's Wendy's car.')

Other examples of pronoun substitution include the following.

*Danny*

- (58) *Ich* Danny home. ('I...')
- (59) *Ich* can't see it. ('I...')
- (60) *Der* is a monkey. ('That one ...')

*Henrik*

- (61) Qu'est que fait, *die* lá. ('What's doing, she there?')
- (62) Il regarde sa – *ihr* fille. ('He looks at his – her daughter.')

Preposition substitutions observed were:

*Danny*

- (63) With the cars *rauf*. ('...on top.')

*Henrik*

- (64) Bateau *von* toto Oma. ('Ship from Grandma's toot-toot.')

*Marc*

- (65) Das Auto *pour* Papa. ('The car for Papa.')
- (66) Auto *pour* Mama. ('Car for Mama.')

Conjunctions were substituted only by Henrik:

(67) Le oua-oua *und* le toto. ('The wow-wow and the toot-toot.')

(68) *Parce-que* ist gefallen. ('Because has fallen.')

(69) *Parce-que* will das zumachen. ('Because want to close that.')

The most frequent part of speech occurring overall as a substituted element in mixed utterances was the noun followed by the adverb, article, pronoun, verb, adjective, preposition and conjunction (Table 3). When functors were considered apart from contentives, they were found to occur more frequently than contentives in the mixed utterances of Danny and Henrik. In their study of a 3-year-old French/English child, Swain & Wesche (1975) also reported nouns to be the most frequently substituted constituents. In addition, they found lexical substitutions belonging to all parts of speech except auxiliaries and articles. Likewise, in the present study single word auxiliary substitutions did not occur; however, article substitutions were encountered in the mixed utterances of all three subjects. The overall percentage of nouns (84.7%) substituted by Lindholm & Padilla's (1978) subjects was considerably higher than that found in the present study. This may be due to the fact that all but one of their subjects were older (3; 6-6; 2) and thus more linguistically advanced than the subjects of the present study. These investigators noted the use of substituted functors only rarely by their bilingual subjects.

Several examples in the speech data of the present subjects suggest why lexical items may be substituted by children in early stages of bilingual development even after the process of differentiation is well underway. It was sometimes observed that the acquisition of an item in one language would be a session or two behind that of the corresponding item in the other language. This acquisition lag resulted in the temporary usage of the first acquired element in utterances of both languages. This was particularly noticeable in the functor categories which consist of frequently occurring members of restricted word classes. For example Danny's *ein* and *da*, Henrik's *das* and *parce-que*, and Marc's *pour* occurred functionally before counterparts in the other language.

Padilla & Liebman (1975) in their study of three bilingual children beginning in Stage I report that their subjects' mixed utterances never contained reduplication of lexical items. They cite such structural consistency as support for their contention that the children observed were already using two distinct linguistic systems. In the present study, however, mixed speech samples from all but Marc contain the occasional occurrence of the duplication of items first in one language and then in the other. The following examples from Danny and Henrik were uttered without internal pauses:

*Danny*

- (70) I put *it das* up. ('I put it it up.')  
 (71) She's *painting malen* da. ('She's painting painting there.')  
 (72) *Look, guck!* ('Look, look!')

*Henrik*

- (73) *Noch* haben *encore* ? ('Have still still ?')  
 (74) Il *fait macht* die Wasser. ('He makes makes the water.')  
 (75) Qu'est *qu'il y a passiert* ? ('What happened happened ?')  
 (76) *Oui, ja.* ('Yes, yes.')

This phenomenon of lexical duplication has also been reported by Imedadze (1967) in the speech of her child learning Russian and Georgian. Probably such duplication can be regarded as an indication of a child's insufficient differentiation of the two languages, although in the instances of reduplication in two-word utterances (examples 72 and 76), it may have been more a case of emphasis.

Phrasal mixtures constituted only a small number of the total mixed utterances (Danny – eight, Henrik – thirteen, and Marc – three). Concurring with findings by Swain & Wesche (1975) and Lindholm & Padilla (1978), the majority of phrasal mixtures produced by subjects of the present study also occurred at phrasal boundaries:

*Danny*

- (77) My blanket *jetzt auf*. ('... now on.')  
 (78) *Und da* it's not flying. ('And there...')  
 (79) *Guck, alle Auto* on the ship. ('Look, all car...')

*Henrik*

- (80) *Ist ein Buch* pour dame. ('Is a book for ladies.')  
 (81) Ça pique, *das hier*. ('It itches, this here.')  
 (82) Jeune fille *ist das*. ('Young girl is that.')

*Marc*

- (83) *Johanna hat* un petit chemin. ('Johanna has a little road.')  
 (84) A joue *die Dame*. ('To play the lady.')

The three phrasal mixtures that did not occur at phrasal boundaries were:

*Danny*

- (85) *Ja, und da hab ich* money put the meter. ('Yes, and there I have...')  
 (86) *Ich will ein* apple eat. ('I want a...')

Marc

(87) *Da Auto pompier de Françoise.* ('There fire engine of Françoise.')

#### SUMMARY AND CONCLUSION

The four subjects of the present study cover a span of linguistic development from Stage I to Stage V. Their degree of mixing observed during this developmental span can be grouped: Stage I mixing levels were between 20 % and 30 %, Stage II levels tended to be between 12 % and 20 %, Stage III levels between 6 % and 12 %, and Stages IV and V between 2 % and 6 %. Mixing rates were thus seen to decrease with advancing linguistic development. High mixing rates during the earliest stages of bilingual development seemed to reflect a general inability of the child to differentiate between the two languages. As the children developed linguistically, the ability to control the languages separately also grew, resulting in a progressive decrease in language mixing.

It appears then that language differentiation is a gradual process which can, at least in part, be traced through decreasing mixing rates. These observations are in agreement with those of previous investigators (Leopold 1970, Imedadze 1967, Swain 1977, Oksaar 1976*a, b* and Volterra & Taeschner 1978) who have suggested that children exposed to two languages from infancy begin by processing the languages through a single system only gradually to differentiate the two. The findings contrast with those reported by other investigators who claim that the children they observed appeared to be using two separate linguistic systems from the beginning (Padilla & Liebman 1975, Bergman 1976). However, as was pointed out earlier, the lack of methodological rigour in these latter studies has resulted in an as yet unconvincing case for the two system theory.

The language development of a bilingual child is affected by both linguistic and sociolinguistic influences. Although the present study has focussed on the former, sociolinguistic factors undoubtedly play an important role as well. In the present study, for example, it was noted that a separation of language by person or the lack of it may affect the speed and ease with which a bilingual child learns to differentiate the languages. Much remains to be investigated regarding the sociolinguistic aspects of why some bilingual children mix languages more than others and why some are able to differentiate their languages sooner than others. Future studies of developmental bilingualism should address these questions in an attempt to gain increased insight into the sociolinguistic parameters of bilingual acquisition.

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